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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/518,704 | 12/17/2004 | Tetsuo Yamada | 930055-2031 | 5674 |

7590 10/26/2006

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| EXAMINER |
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BUDD, MARK OSBORNE

| ART UNIT | PAPER NUMBER |
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2834

DATE MAILED: 10/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/518,704

Applicant(s)

YAMADA ET AL.

Examiner

Mark Budd

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-47 is/are pending in the application.
- 4a) Of the above claim(s) 46 and 47 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-19 and 37-45 is/are allowed.
- 6) ☒ Claim(s) 20-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 December 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 12-17-04 8-4-05
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

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The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 20, 21, 26 and 30 are rejected under 35 USC 102 (a) as being anticipated by Shibata. Figure 4 of Shibata teaches a thin-film piezoelectric resonator #18, top and bottom electrodes #16, a diaphragm #14, and a substrate #12 having a cavity. The angle of the cavity walls in relation to the substrate major surface is 90°. Regarding claim 21, note figures 33-35 show this specific electrode configuration.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 22 is rejected under 35 USC 103 (a) as being unpatentable over Shibata in view of Yamada. Shibata as discussed above teaches the resonator structure and provides only a single layer of piezoelectric material. However, Yamada (compare figure 1 vs figure 2 and figure 13 vs figure 14) teaches that two piezoelectric layers can be used in lieu of a single layer. Such a substitution allows lowering of the impedance. Thus, for at least this reason it would have been obvious to one of ordinary skill in the art to provide Shibata with two piezoelectric layers.

Claims 23-25 are rejected under 35 USC 103 (a) as being unpatentable over Shibata in view of Bernstein. Shibata teaches the basic resonator but the lower electrode is adhered directly to the diaphragm. Bernstein (figure 5) teaches it is advantageous to place an additional layer #74 of, for example, silicon dioxide between the silicone diaphragm #76 and the lower electrode #80 in order to improve the characteristics of the resonator. Thus, for this reason it would have been obvious to one of ordinary skill of the art to place such a layer between the diaphragm and the electrode of Shibata.

Claims 27-29 are rejected under 35 USC 103 (a) as being unpatentable over Shibata in view of Larsen. As noted above, Shibata teaches the basic resonator structure. Shibata does not teach providing a diaphragm shape that includes nonparallel sides. However, Larson teaches such a shape is preferred in order to provide a resonator that has an absorption and/or transmission spectrum that does not include irregularities generated

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by transverse resonant modes. Thus, for at least this reason it would have been obvious to one of ordinary skill in the art to provide an irregular polygon shape for the device of Shibata.

Claims 31-36 are rejected under 35 USC 103 (a) as being unpatentable over Shibata. As pointed out previously, Shibata teaches the resonator structure. Shabbat does not explicitly teach the specific dimensions for the electrodes and a piezoelectric layer. However, it has long been held that optimization of a known structure for a specific use is within the steel expected of the routineer. Thus, to select certain optimum dimentions for Shibata would have been obvious to one of ordinary skill in the art.

Cclaims 1-19 and 37-45 are allowed.

Further cited of interest are Yun and Fukui.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Budd whose telephone number is 571-272-2019.


The examiner can normally be reached on Mmonday-Thursday from 6 a.m. to 4 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darin Schuberg, can be reached on 571-272-2044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Mark Budd
Primary Examiner
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